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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

APR 5 1993

> OFFICE OF PREVENTION, PESTICIDES AND **TOXIC SUBSTANCES**

MEMORANDUM

SUBJECT: PP#1F4025. MAT 7484 in/on Corn Commodities.

Review of Permanent Tolerance Petition Request.

CBTS: 8893 DP#: D171159

MRID: 420054-77 thru -96

PP#1F4025. MAT 7484 in/on Corn Commodities.

Review of BEAD memo of 11/10/92: Report of Petition

Method Validation Trial of Mobay Method 100202.

CBTS: 10862 DP#: D184687

420054-83 and -85 MRID:

ID# 003125-URE. AZTEC 2.1% Granular Insecticide.

Application for Label Registration.

CBTS: 8894 DP#: D171116 MRID:

ID# 003125-URR. MAT 7484 Technical.

Application for Product Registration.

CBTS: 8895 DP#: D171080 MRID: N/A

PP#2G4048. MAT 7484 in/on Corn Commodities. Review of Temporary Tolerance Petition Request.

CBTS: 8913 DP#: D171354

MRID: 420054-77 thru -96

ID# 003125-EUP-ENE. AZTEC 2.1% Granular Insecticide.

Application for Experimental Use Permit.

CBTS: 8915 DP#: D171321 MRID:

FROM: Maxie Jo Nelson, Ph.D., Chemist

Chemistry Branch I - Tolerance Support

Health Effects Division (H7509C)

THRU: Debra Edwards, Ph.D., Chief

Chemistry Branch I - Tolerance Support

Health Effects Division (H7509C)

TO: M. Mautz/R. Forrest, PM Team 14

Insecticide-Rodenticide Branch

Registration Division (H7505C)

The petitioner, Miles Inc. [formerly Mobay Chemical Corporation], proposes the establishment of permanent [PP#1F4025] or temporary [PP#2G4048] tolerances for residues of a NEW ORGANOPHOSPHATE INSECTICIDE, MAT 7484, in or on:

These two petitions constitute the first food use requests for tolerances for this new chemical.

In conjunction with these tolerance requests, Miles also seeks the registration of MAT 7484 Technical [003125-URR] and the formulated product AZTEC 2.1% Granular Insecticide [AZTEC 2.1G; 003125-URE; 003125-EUP-ENE].

AZTEC 2.1G contains two active ingredients [ai]: MAT 7484 and cyfluthrin. Cyfluthrin is a synthetic pyrethroid insecticide with registered uses and tolerances [40 CFR 180.436, 185.1250, 186.1250].

Co-pending PP#s 1F4026 and 2G4049 propose tolerances for cyfluthrin residues in/on corn commodities at 0.01 ppm from use of AZTEC 2.1G. Those petitions have recently undergone CBTS review [M. Nelson, memo of 3/9/93].

In May 1992, Miles was issued [memo of 5/5/92] an EUP [3125-EUP-202] with crop destruct for the proposed use of AZTEC 2.1G. That EUP authorized application of up to 2,942 lbs [58.85 lbs ai MAT 7484 and 2.95 lbs ai cyfluthrin] on up to 403 acres of corn in Iowa.

Since MAT 7484 is a new chemical, there are as yet no established tolerances. No other petitions for this chemical are currently pending.

MAT 7484 is not subject to reregistration under FIFRA '88.

The chemical name of MAT 7484 is Q-[2-(1,1-dimethylethyl)-5-pyrimidinyl] Q-ethyl Q-(1-methylethyl) phosphorothicate].

MAT 7484 is also known as BAY MAT 7484. The proposed ANSI common name is phostebupirim.

Its chemical structure is:

CONCLUSIONS

- 1a. The product chemistry data are not adequate to support the proposed permanent tolerances. Additional data under GRN 63-6 [boiling point], 63-7 [density], and 63-12 [pH] for BAY MAT 7484 Technical are needed. [See CBTS review, "BAY MAT 7484. Review of Product Chemistry Data Submitted in Support of Registration of New Chemical Insecticide", M. Nelson, 8/10/92.]
- 1b. The manufacturing process of BAY MAT 7484 Technical is not yet completely delineated. Additional information under GRN 61-2 [Description of Beginning Materials and Manufacturing Process] is needed to support a permanent tolerance. [See aforecited product chemistry review, 8/10/92.]
- 1c. AZTEC 2.1G is not yet registered with EPA. Determination as to whether the inert ingredients in the formulation are cleared is under the purview of RD.
- 2a. The proposed use pattern is sufficiently delineated.
- 2b. Phostebupirim is not yet an accepted ANSI common name so it should not appear on the proposed labeling; the petitioner needs to submit a revised Section B.
- 3a. The nature of the residue in corn plants has been adequately delineated. The residue of concern for regulatory purposes [based on observed residues] is parent MAT 7484 only.
- 3b. The nature of the residue in ruminants has been adequately delineated. The residue of concern for regulatory purposes [based on observed residues] would be MAT 7484 and its oxygen analog OMAT. However, regulation of residues in animal commodities is not needed at this time; see Conclusions 7b and 7c.
- 3c. The nature of the residue in poultry has been adequately delineated. The residue of concern for regulatory purposes [based on observed residues] would be parent MAT 7484 only; however, for the sake of consistency with the observed residue of concern in ruminants, both MAT 7484 and OMAT should be regulated in poultry. Regulation of residues in animal commodities is not needed at this time; see Conclusions 7b and 7c.
- 3d. Because no detectable residues of OMAT are expected in any commodity from this proposed use, regulation at this time can be in terms of parent compound MAT 7484 only.
- 4a. Analytical Method 100202 [GLC/FPD, phosphorous filter] for MAT 7484 [and OMAT] in corn matrices has successfully completed PMV and is suitable for enforcement purposes [contingent upon incorporation of the revisions specified in Conclusion 4b].
- 4b. The following revisions to Method 100202 need to be made, based upon the BEAD PMV report:

- The concentration of the calibration samples should be reduced to be more in line with expected sample recoveries; and,
- (2) The method should specify some way of verifying the cleanliness of the GPC system prior to the injection of the sample extracts.

The petitioner should revise Method 100202 to address these two comments, and resubmit it for review.

NOTE: If Method 100202 is used in future to enforce tolerances in/on commodities in which OMAT is a detectable residue [and part of the regulable residue], it would need to be further revised to incorporate this additional comment from BEAD:

- (3) A comment should be inserted in the method indicating that the detector gas flows must be optimized for sensitivity to OMAT.
- 4c. Method 100202 was found to be specific for detecting MAT 7484 [and OMAT] in corn matrices in the presence of other [registered] phosphorous-containing pesticides.
- 4d. FDA multiresidue screening data for MAT 7484 [and OMAT] via Protocols C, D, and E were submitted. Test results have been forwarded to FDA for review and updating of PAM I.
- 4e. Analytical methodology for animal commodities are not required in conjunction with the two petitions covered by this review.
- 5a. Adequate storage stability data for MAT 7484 [and OMAT] are available to support the stability of residues in stored corn matrices.
- 5b. Adequate storage stability has been demonstrated for MAT 7484 in animal matrices [and for OMAT in milk, eggs, muscle, and fat. OMAT has been shown to degrade rapidly in liver and more slowly in kidney tissues to 2-(1,1-dimethylethyl)-5-hydroxypyrimidine {aka TBHP} during freezer storage].
- 6a. Corn field trial data support the tolerances requested by the petitioner:

for residues of MAT 7484 in conjunction with the proposed use pattern.

6b. Food/feed additive tolerances for residues of MAT 7484 in processed corn commodities were not requested, and are not needed [based on the processing study data].

DETAILED CONSIDERATIONS

MANUFACTURE, FORMULATION, AND OTHER PRODUCT CHEMISTRY

AZTEC 2.1G is a granular insecticide formulated combination product which combines the use of a **new** organophosphate ai, MAT 7484 [aka phostebupirim, prop. ANSI], with a currently registered synthetic pyrethroid ai, cyfluthrin.

AZTEC 2.1G [EPA File Symbol 3125-URE] is not yet registered with EPA. Determination as to whether the inert ingredients in the formulation are cleared is under the purview of RD.

For discussion of the formulation of AZTEC 2.1G, see the Confidential Appendix [Attachment 4] to this review. For information pertaining to cyfluthrin, see co-pending PP#s 1F4026 and 2G4049 [CBTS memo of 3/9/93, M. Nelson].

The manufacturing process of BAY MAT 7484 Technical [EPA File Symbol 3125-URR] is discussed in the Confidential Appendix to CBTS's review of product chemistry data for BAY MAT 7484 Technical [M. Nelson memo of 8/10/92]. The information submitted does not fully satisfy the requirements of 40 CFR §158.160-§158.165 [Guideline Ref. No. (GRN) 61-2]. Further information has been requested.

Additional product chemistry data for BAY MAT 7484 Technical have also been requested on the boiling point, density, and pH [GRNs 63-6, 63-7, and 63-12, respectively] to fully satisfy the requirements of 40 CFR §158.190 [aforecited memo of 8/10/92].

Conclusions:

- (1) The GRN 61-2, 63-6, 63-7, and 63-12 requirements will need to be satisfied prior to a favorable recommendation for the establishment of **permanent** tolerances on corn commodities.
- (2) The determination as to whether the inert ingredients in AZTEC 2.1G formulation are cleared is under the purview of RD.

PROPOSED USE

For control of soil insect pests, make one application [in-furrow or band-incorporated] of AZTEC 2.1% Granular to soil at corn planting.

The proposed use rate is 6.7 oz of product per 1000 ft of row. The maximum use rate per acre, based on the narrowest row spacing of 30", is 7.3 lbs/A.

In terms of ai's, the rates are 0.0084 lb MAT 7484 and 0.00042 lb cyfluthrin per 1000 ft of row, or, for the narrowest row spacing of 30", the maximum rate per acre will be 0.146 lb MAT 7484 and 0.0073 lb cyfluthrin.

A maximum of 7.3 lbs AZTEC 2.1% Granular may be applied per acre per crop season.

For use only in the states of: AZ, AR, CO, ID, IL, IN, IA, KS, KY, MI, MN, MO, MT, NE, NV, NM, ND, OH, OK, PA, SD, TN, UT, VT, WV, WI, and WY.

Conclusions:

- (1) The proposed use is sufficiently delineated.
- (2) Phostebupirim is not yet an accepted ANSI common name [confirmed by telecon between M. Mautz and petitioner, 3/16/93] so it should not appear on the proposed labeling; the petitioner needs to submit a revised Section B.

NATURE OF THE RESIDUE

<u>Plants</u>. A metabolism study in corn ["Metabolism of Pyrimidinyl-2-14C MAT 7484 in Corn", 10/19/90, Mobay Report 99776, MRID 420054-77] was submitted. The performing lab was Mobay Corporation.

Corn was planted in pots containing soil treated with pyrimidinyl-2-"C MAT 7484 at 2.4 ppm [4X the maximum recommended field application rate of 0.146 lb ai/A]. Half the plants were harvested [kernels, cobs/husks, stalks/leaves, forage composite] at milk stage [96 days posttreatment] and the remainder allowed to mature to dryness [117 days posttreatment] prior to harvest [kernels, cobs/husks, stalks/ leaves, fodder composite].

Samples were processed [chopped, frozen, pulverized, and homogenized], then stored at -20°C for 2-7 months before aliquots were extracted and radioassayed. Radioactivity in sample extracts was determined by liquid scintillation counting [lsc]; solid samples were combusted and the released CO₂ trapped and quantitated by lsc. Approximately 0.3% of the total radioactivity applied to the soil was found in corn plants. The distribution of radioactivity [as C MAT 7484 equivalents] was:

0.8
3.0 2.6

For identification of the radioactivity, kernels and composites of forage and fodder samples were extracted and analyzed [HPLC, GC/TLC, TLC] following the procedures diagrammed in Figures 1 and 2, respectively. Isolated metabolites were also subjected to electron impact [EI] and chemical ionization [CI] mass spectrometry. Comparison was

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Identity of product inert ingredients.				
Identity of product impurities.				
Description of the product manufacturing process.				
Description of quality control procedures.				
Identity of the source of product ingredients.				
Sales or other commercial/financial information.				
A draft product label.				
The product confidential statement of formula.				
Information about a pending registration action.				
FIFRA registration data.	٠			
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made to independently synthesized reference standards, the composition and structures of which had been verified by both MS and NMR analysis [MRID 420054-81].

By this means, the identification and quantitation of ¹⁴C residues in corn kernels was determined to be:

	· ·	Harvest ppm (MAT		Harvest ppm (MAT
Compound'	-8	<u>equivs.)</u>	<u>-8</u> _	<u>equivs.)</u>
MAT 7484	<2	<0.01	<1	<0.01
OMAT	0	0	0	0
TBHP	0	0	0	0
TBHP-glucose	3	0.01	1	0.01
TMAA	1	<0.01	1	0.01
HTBHP-conjugates	<1	<0.01	0	
HTBHP-glucose	. 1	<0.01	1	0.01
Glucose as starch	75	0.30	84	0.67
Polar materials	8	0.03	· 7	0.06
Unextracted	0	0	0	0
Losses in prep'n	3		5	
Unaccounted for	7	* · · · · · · · · · · · · · · · · · · ·	0	
TOTAL:	100		100	

1 Chemical names, structures, and abbreviations of MAT 7484 and related reference standards are given in Figure 3.

And the identification and quantitation of ¹⁴C residues in corn forage and fodder samples was determined to be:

	Fo	orage	<u> </u>	Fodder
Compound	8	ppm (MAT equivs.)	*	ppm (MAT equivs.)
Compound		<u> </u>		
MAT 7484	1	0.01	<1	<0.01
OMAT	0	0	0	0
TBHP	5	0.04	7	0.18
TBHP-glucose	13	0.12	12	0.31
TMAA	1	0.01	7	0.18
HTBHP-glucose	18	0.16	11	0.29
HTBHP-conjugate 1	19	0.17	11	0.29
HTBHP-conjugate 2	14	0.13	12	0.31
HTBHP-conjugate 3	1	0.01	4	0.10
HTBHP-conjugate 4	2	0.02	0	0
Polar extractable	5	0.04	``6	0.16
Polar, acid hydrolysis				
released	5	0.04	7	0.18
Polar, base hydrolysis				
released	4	0.04	6	0.16
Not released from solids	1	0.01	3	0.08
Losses in preparation	8		7	
Unaccounted in analysis	. 3		7	
TOTAL:	100		100	

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MAT 7484 [or OMAT] was not detected in corn kernels at either fresh or dry harvest. The major metabolite in kernels was 'C-glucose [from pyrimidinyl-2-16 ring degradation] incorporated into starch, which accounted for 75% and 84% of the 'C residue at fresh and dry harvest, respectively. The incorporation into glucose was demonstrated by formation of the radiolabeled phenylhydrazine derivative, phenyl glucosazone, which was compared to a reference standard in several TLC systems. Minor metabolites detected were TBHP-glucose conjugate, HTBHP conjugates, and TMAA; these each accounted for 1-3% of the residue at harvest. TMAA is not found in animals; however, TOX has indicated [conversation between R. Loranger and E. Doyle, 4/2/93] this is not a matter of concern.

MAT 7484, equivalent to 1% of the ¹⁴C residue, was detected in corn forage; MAT 7484 was not detected [<0.01 ppm MAT equivalents] in corn fodder. OMAT was not detected in either the forage or fodder. The major metabolites found were HTBHP conjugates, TBHP, and TBHP-glucose conjugate; these accounted for 72% and 57% of the ¹⁴C residues in the forage and fodder, respectively. Polar products accounted for an additional 14-19% of the residue.

The proposed metabolic pathway for the degradation of MAT 7484 in corn plants is shown in Figure 4. The O-P bond in MAT 7484 is cleaved by hydrolysis to yield TBHP, which is subsequently oxidized to HTBHP. These metabolites are extensively conjugated with endogenous materials, including glucose. Some TBHP is degraded to TMAA, which is further metabolized and incorporated into glucose and, ultimately, into starch. Oxidation of MAT 7484 into its oxygen analog, OMAT, was not detected; if it occurred, OMAT was apparently rapidly hydrolyzed to TBHP.

Conclusions:

The nature of the residue in corn plants has been adequately delineated. The residue of concern for regulatory purposes [based on observed residues] is parent MAT 7484 only.

Animals - Ruminants. A ruminant metabolism study ["The Metabolism of 14C-MAT 7484 in Lactating Goats", 2/2/90, Mobay Report 99791, MRID 420054-78] was submitted. The performing lab was Mobay Corporation.

[Pyrimidinyl-2-14C] MAT 7484 was administered orally by capsule on 3 consecutive days to each of two lactating goats at a rate [0.3 mg/kg body wt] equivalent to 10.4 ppm in feed. [The petitioner calculates this rate represents 2190% the highest residue of MAT 7484 anticipated in corn treated at the maximum proposed field use rate of 0.15 lb ai/A; see Meat, Milk, Poultry, and Eggs Section. We concur with that calculation.]

Milk was collected twice daily, radioassayed, and then frozen stored [-15°C] for later [<12 months] sample preparation/analysis.

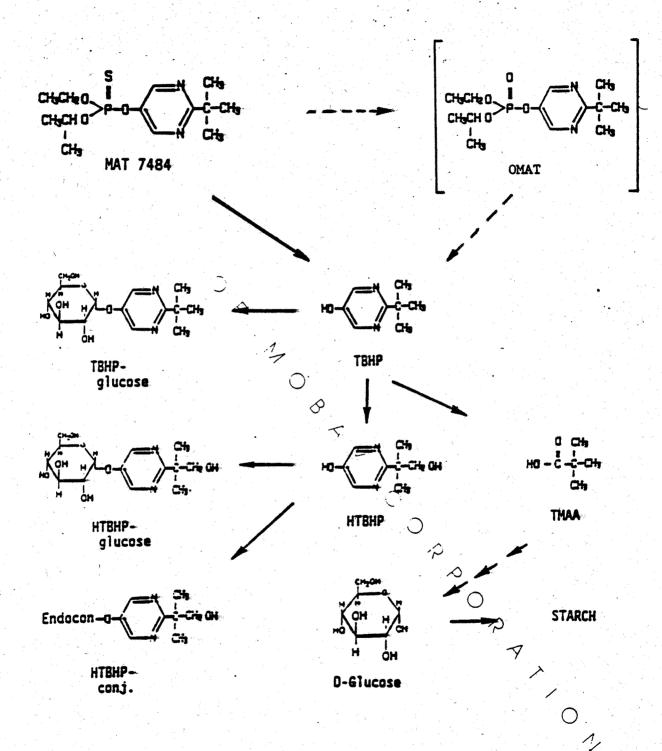


Figure 4. Proposed metabolic pathway for MAT 7484 in corn

Four hours following the third dose, the goats were sacrificed and liver, kidneys, and representative composites of muscle and fat were excised. Samples were diced, frozen, pulverized to powders, aliquots removed for radioassay, and the remainder frozen stored [-15°C] for later [<12 months] extraction and analysis.

Milk and tissue samples were extracted with a series of solvents, subjected to various clean-up/separation and hydrolysis procedures, and analyzed [radioassay, HPLC] to quantitate/identify residues. Identities of the major metabolites were confirmed by GC/MS.

Total radioactivity found in milk and tissues was 0.002-0.008 ppm in milk, 0.003 ppm in muscle, 0.007 ppm in fat, 0.050 ppm in liver, and 0.160 ppm in kidney.

Identification and quantitation of the total radioactivity showed it to be distributed [% 14C] as follows:

	Kidney	Liver	<u>Fat</u>	Muscle	Milk ⁷
MAT 7484	0	23	62	38	69, 36
OMAT	0	1	2	<1	1, 4
TBHP	3	8	5	0	8, 12
HTBHP	6	15	12	39	9, 21
Conjugate 1	56	10	6		
Conjugate 22	12			14	
Unidentified Metabolites	20 ³	35 ⁴	3 ⁵	4 ⁶	6, 16 ⁸
Unextractable	3	1	10	0	7, 10
Aqueous		5	· ·	5	,
TOTAL:	100	98	100	100	100, 99

- A mixture of conjugates; base hydrolysis released TBHP and HTBHP.
- A sulfate conjugate of TBHP.
- 4 metabolites: 6, 5, 8, and 1%.
- 8 metabolites: 9, 6, 6, 4, 3, 3, 3, and 1%. Acid hydrolysis converted these to TBHP, HTBHP, or very polar material.
- 1 metabolite
- 2 metabolites: 2% each.
- Reported separately for each goat.
- 4 metabolites: 1, 2, 2, 1% and 2, 12, 1, 1%.

MAT 7484 was found in milk and all tissues except kidney. OMAT was also found in milk and all tissues except kidney, but at very low levels. The major metabolites found in milk and tissues were TBHP, HTBHP, and their conjugates.

The proposed metabolic pathway for MAT 7484 in goats is shown in Figure 5. The initial step in ruminant metabolism can be either cleavage of the O-P bond by hydrolysis to yield TBHP, or oxidation to OMAT followed by cleavage of its O-P bond by hydrolysis to yield TBHP. The TBHP can be oxidized to HTBHP. Both TBHP and HTBHP form conjugates. [Alternatively, MAT 7484 can be initially oxidized at the tert-butyl group, followed by hydrolysis to yield HTBHP; the required intermediate for this pathway was not observed.]

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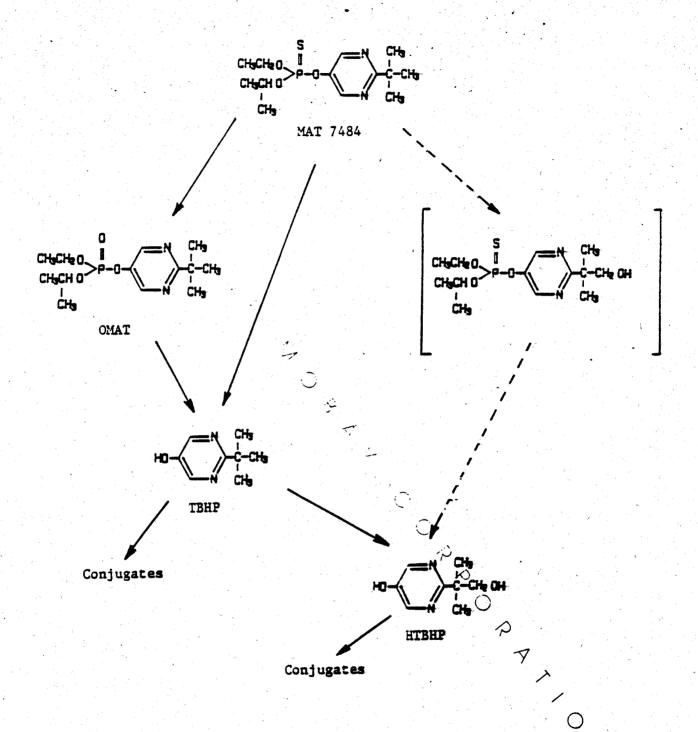


Figure 5. Proposed metabolic pathway for MAT 7484 in goats.

Toxicology Branch has been consulted about the residue of toxicological concern in plants and animals. [Conversation between M. Nelson and E. Doyle, 3/25/93.] Other than parent MAT 7484, only OMAT--where present--was considered to warrant regulation.

Conclusions:

The nature of the residue in ruminants has been adequately delineated. The residue of concern [based on observed residues] for regulatory purposes would be MAT 7484 and its oxygen analog OMAT. However, regulation of residues in animal commodities is not needed at this time; see Meat, Milk, Poultry, and Eggs.

Animals - Poultry. A poultry metabolism study ["The Metabolism of 14°C MAT 7484 in Laying Hens", 3/17/90, Mobay Report 100107, MRID 420054-79] was submitted. The performing lab was Mobay Corporation.

[Pyrimidinyl-2-14C] MAT 7484 was administered orally by capsule on 3 consecutive days to each of 15 laying hens at a rate [1.05 mg/kg avg body wt] equivalent to 21 ppm in feed. [The petitioner calculates this rate represents 15,000% the highest residue of MAT 7484 anticipated in corn treated at the maximum proposed field use rate of 0.15 lb ai/A; see Meat, Milk, Poultry, and Eggs Section. We concur with that calculation.]

Eggs were collected daily and broken and mixed to form a composite sample; aliquots were removed for radioassay and the rest frozen stored [\leq -10°C] for later [<6 months] sample preparation/analysis.

Three hours after the third dose, the hens were sacrificed, plucked, and skin, composite muscle, composite fat, heart, liver, kidney, and gizzard [minus contents and lining] were removed. All samples were diced, frozen, composited by tissue type [skin, muscle, and gizzard pulverized to powders], aliquots removed for radioassay, and the rest frozen stored [<-10°C] for later [<6 months] extraction/analysis.

Egg and tissue samples were extracted with a series of solvents, subjected to various clean-up/separation and hydrolysis procedures, and analyzed [radioassay, HPLC] to quantitate/identify residues. Identities of the major metabolites were confirmed by GC/MS.

Total radioactivity reported in egg and tissues was:

<u>Matrix</u>	<u>Ppm</u>	<u>Matrix</u>	_Ppm_
Eggs		Fat	0.024
Day 1	0.001	Skin	0.037
Day 2	0.005	Gizzard	0.131
Muscle	0.011	Kidney	0.519
Heart	0.016	Liver	0.778

Identification and quantitation of the total radioactivity showed it to be distributed [% 16] as follows:

<u>K</u>	idney	<u>Liver</u>	<u>Fat</u>	Muscle	<u>Skin</u>	<u>Heart</u>	Gizzard	Eggs
MAT 7484	1	<1	61	. 2	2	8	61	0
OMAT	0	0	0	0	0	0	0,	0
TBHP	10	22	11	7	3	18	4	0
HTBHP	11	38	9	43	15	27	5	0
Conj. 1	14		·	11	11	13	,	-
Conj. 2 ²		,	4 _	,	39,	3	-,	- 10
Unknowns	່ 58 ³	284	92	30 ⁶	19'	21°	<25 ⁹	89 ¹⁰
Unextract.	6	10	5	9	12	10	5	10
TOTAL:	100	98	99	102	101	100	<100	99

Sulfate conjugate of HTBHP [aka K2, S2, M2, H1] ± polar material. Sulfate conjugate of TBHP [aka F2, S1, H4].

- 10 metabolites [mainly sulfate conjugates], 2 at >10% each of the total residue. Hydrolysis [acid, base, sulfatase] released TBHP, HTBHP, an unidentified hydrolysis product, and polar material.
- 9 metabolites, none representing >6% of the total radioactivity.
- 3 metabolites, none representing >6% of the total radioactivity.
- 4 metabolites at 12, 8, 8, and 2% of the total radioactivity.
- 3 metabolites, none representing >9% of the total radioactivity.
- 7 metabolites, none representing >9% of the total radioactivity.
- 9 metabolites, none representing >7% of the total radioactivity. 2 metabolites; acid hydrolysis yielded HTBHP.

MAT 7484 was found in all tissues, but not eggs. OMAT was not found in any tissue or eggs. The major metabolites found in tissues and eggs were TBHP, HTBHP, and their conjugates.

The proposed metabolic pathway for MAT 7484 in chickens is shown in Figure 6. The initial step in poultry metabolism can be either cleavage of the O-P bond by hydrolysis to yield TBHP, or oxidation to OMAT [not observed] followed by cleavage of its O-P bond by hydrolysis to yield TBHP. The TBHP can be oxidized to HTBHP. Both TBHP and HTBHP form conjugates. [Alternatively, MAT 7484 can be initially oxidized at the tert-butyl group, followed by hydrolysis to yield HTBHP; the required intermediate for this pathway was not observed.]

Conclusions:

The nature of the residue in poultry has been adequately delineated. The residue of concern for regulatory purposes [based on observed residues] would be parent MAT 7484 only; however, for the sake of consistency with the observed residue of concern in ruminants, both MAT 7484 and OMAT should be regulated in poultry. Regulation of residues in animal commodities is not needed at this time; see Meat, Milk, Poultry, and Eggs.

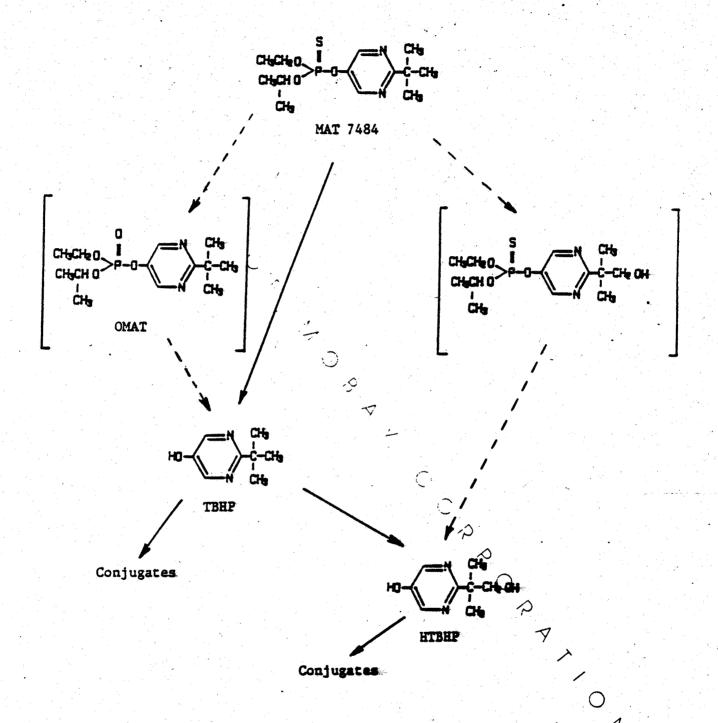


Figure 6. Proposed metabolic pathway for MAT 7484 in poultry.

ANALYTICAL METHODS

Corn Matrices. Residue data in all field and sweet corn commodities [fresh and processed] samples were obtained using the analytical procedure described in Mobay Report 100202 ["An Analytical Residue Method for the Determination of MAT 7484 and MAT 7484 Oxygen Analog {OMAT} in Corn", 6/20/90, MRID #420054-83].

Method 100202 is a GLC/FPD [phosphorous filter] procedure which has recently undergone successful petition method validation [PMV] of MAT 7484 [and OMAT] in corn grain and forage [see BEAD memo of 11/10/92, M. Law, PP#1F4025]. The following recoveries were reported:

Commodity	Spike (ppm)	%MAT 7484	_%OMAT	
Corn grain	0.01	102, 119	118, 118	
	0.05	111, 107	107, 108	
Corn forage	0.01	100, 108	108, 108	
	0.05	99, 97	65, 74	

No detectable residue [defined as <0.01 ppm] was reported in corn grain or forage control samples. BEAD estimates the actual limit of detection in corn commodities is 0.002 ppm for MAT 7484 [and 0.01 ppm for OMAT].

The following revisions to Method 100202 need to be made based upon the BEAD PMV report:

- (1) The concentration of the calibration samples should be reduced to be more in line with expected sample recoveries; and.
- (2) The method should specify some way of verifying the cleanliness of the GPC system prior to the injection of the sample extracts.

The petitioner should revise Method 100202 to address these two comments, and resubmit the method for review.

NOTE: If Method 100202 is used in <u>future</u> to enforce tolerances in/on commodities in which OMAT is a detectable residue [and part of the regulable residue], it would need to be further revised to incorporate this additional comment from BEAD:

(3) A comment should be inserted in the method indicating that the detector gas flows must be optimized for sensitivity to

A description of the analytical procedure [Method 100202] and a table of recovery data from corn commodities are contained within the MAT 7484 document ["MAT 7484 DER"] attached to this review as Attachment 2. FID "N/P" mode detection is used as a confirmatory procedure.

Representative chromatograms and sample calculations are provided in the petition.

An independent lab validation of Method 100202 was conducted by ABC Laboratories ["Validation of Mobay Report 100202 According to Provisions Stipulated in PR Notice 88-5", 11/27/90, Mobay Report 100325, MRID 420054-85]. No modifications were made to the method. Recovery values after spiking at 0.01 and 0.05 ppm levels were:

	% MAT 7	484	% OM	AT
Corn Matrix	0.05 ppm	0.01 ppm	0.05 ppm	0.01 ppm
green forage	82, 88	90, 90	72, 76	70, 80
dry kernels	90, 100, 108	90, 120	82, 88, 104	70, 100

Forage and grain control samples showed no interference at the MAT 7484 or OMAT retention times; all control values were <0.01 ppm.

An interference study was also conducted by ABC Laboratories ["MAT 7484 Residue Analysis, Interference Study", 5/3/91, Mobay Report 101204, MRID 420054-84]. Method 100202 utilizes an FPD [phosphorous mode]; this detector is only sensitive to compounds containing phosphorous. Of the 102 pesticides registered for use on corn, only 22 contain phosphorous. Those 22 pesticides were prepared at their tolerance levels and tested for chromatographic interference with MAT 7484 [and OMAT].

Method 100202 was found to be specific for detecting MAT 7484 [and OMAT] in corn matrices in the presence of these competitor pesticides. Using the GLC conditions stated in the method, there were no interferences from 20 of the 22; interference from the remaining 2 [diazinon, disulfoton] was resolved by using a different gc column.

FDA multiresidue screening data ["MAT 7484 and MAT 7484 Oxygen Analog Multiresidue Method Testing", 8/20/89, Mobay Report 99715, MRID 420054-86] by Protocols C, D, and E were submitted. Protocol A was not required since MAT 7484 [and OMAT] are not N-methylcarbamates. Protocol B was not required since MAT 7484 [and OMAT] do not contain acid or phenolic structures. Test results have been forwarded to FDA [memo of M. Nelson, 12/9/92] for review of adequacy and updating of PAM I.

Conclusions:

- (1) Analytical Method 100202 [GLC/FPD, phosphorous filter] for MAT 7484 [and OMAT] in corn matrices has successfully undergone PMV and is available for enforcement purposes [contingent upon incorporation of revisions stated below].
- (2) The following revisions to Method 100202 need to be made based upon the BEAD PMV report:
 - (a) The concentration of the calibration samples should be reduced to be more in line with expected sample recoveries; and,
 - (b) The method should specify some way of verifying the cleanliness of the GPC system prior to the injection of the sample extracts.

The petitioner should revise Method 100202 to address these two comments, and resubmit the method for review.

NOTE: If Method 100202 is used in future to enforce tolerances in/on commodities in which OMAT is a detectable residue [and part of the regulable residue], it would need to be further revised to incorporate this additional comment from BEAD:

- (c) A comment should be inserted in the method indicating that the detector gas flows must be optimized for sensitivity to OMAT.
- (3) Method 100202 was found to be specific for detecting MAT 7484 [and OMAT] in corn matrices in the presence of other [registered] phosphorous-containing pesticides.
- (4) FDA multiresidue screening data by Protocols C, D, and E were submitted. Test results have been forwarded to FDA for review and updating of PAM I.

Animal Matrices. No analytical method was submitted to determine residues of MAT 7484 in meat, milk, poultry, or eggs. The petitioner contends such methodology is not needed since tolerances on animal commodities are not warranted in conjunction with the proposed use. CBTS concurs; the proposed use results in a 40 CFR 180.6(a)(3) situation.

Conclusion:

Analytical methodology for animal commodities are not required in conjunction with the two petitions covered by this review.

STORAGE STABILITY

<u>Crop Matrices</u>. Corn field trial and processing study samples were frozen stored [ca -20°C] for 62-504 days prior to residue analysis [see Table 4, p. 7, of Attachment 2 (MAT 7484 DER)]. Corn ¹⁴C metabolism study samples were frozen stored [-20°C] for 2-7 months prior to analysis.

A storage stability study [Mobay Report 101234, MRID 420054-87] with pyrimidinyl-2- C MAT 7484 [and OMAT] in corn commodities [milk-stage kernels, dry kernels, green forage, dry fodder] was submitted to support the field trial and processing studies, and the corn metabolism study. The study was conducted from 2/90 through 8/91.

Fortification was at 1.0 ppm; freezer storage at < -20°C; sampling intervals were 0, 1, 33, 123, 187, and 515 days. Extraction efficiency of the radioactive residues was 94-100% in kernels and 88-95% in forage and fodder. The % degradation in all matrices was 0-4% for MAT 7484 [4-15% for OMAT] throughout the study.

Storage stability data for pyrimidinyl-2-14°C MAT 7484 [and OMAT] residues in red beets, kale, and wheat heads [rotational crop matrices] stored [< -20°C] up to 475 days following fortification [1.0 ppm] were also included [MRID 420054-87]. Extraction efficiency of the radioactive residues was 89-100%. The % decomposition was 0-11% for MAT 7484 [and OMAT].

Conclusion:

Storage stability data for MAT 7484 [and OMAT] are available to support the stability of residues in stored corn matrices.

Animal Matrices. Goat [milk, tissue] ¹⁴C metabolism study samples were frozen stored [ca -20°C] for <12 months prior to analysis and hen [egg, tissue] ¹⁴C metabolism study samples for <6 months prior to analysis.

A report [Mobay Report 100128, MRID 420054-80] describing the stability of pyrimidinyl-2-14°C MAT 7484 [and OMAT] in cow tissues [liver, fat, kidney, muscle], milk, and eggs stored [1, 2, 3, 6, 9, or 12 months] under freezer conditions [< -20°C] after fortification [ca 1.2 ppm] was submitted to support the animal [goat, hen] metabolism studies. This stability study was run concurrently with the freezer storage of the metabolism study samples. Extraction efficiency of the radioactive residue in these matrices was ≥95%.

A maximum of 17% degradation of MAT 7484 was observed in the 1-month fat sample, with all other samples showing $\geq 90\%$ MAT 7484 at all time points in all the matrices.

OMAT was stable (≥88%) in muscle, fat, milk, and eggs for 12 months, but was hydrolyzed to TBHP in liver [up to 95%] and kidney [up to 56%] during the 12 month study.

Conclusion:

Adequate storage stability has been demonstrated for MAT 7484 in animal matrices [and for OMAT in milk, eggs, muscle, and fat. OMAT has been shown to degrade rapidly in liver and more slowly in kidney tissues to TBHP during freezer storage].

RESIDUE DATA

A MAT 7484 data evaluation record [DER], "Magnitude of the residue in/on field and sweet corn and in field corn processed commodities", 12/21/92, has been prepared under CBTS's supervision by Dynamac Corporation (contractor), and is appended to this review as Attachment 1 [which see for details]. The DER underwent secondary review and revision within CBTS, and reflects Branch policy.

Conclusions:

(1) The field trial data submitted for residues of MAT 7484 support the permanent [or temporary] tolerances requested by the petitioner:

		includes sweet@	
Corn,	grain,	field and pop@	0.01 ppm
Corn,	forage	and fodder, field, pop, and sweet@	0.01 ppm

in conjunction with the proposed use pattern.

(2) Food/feed additive tolerances for MAT 7484 residues in processed corn commodities were not requested, and are not needed [based on the processing study data].

RESIDUES IN MEAT, MILK, POULTRY, AND EGGS

Corn commodities may be used in feeding beef and dairy cattle [grain, forage, fodder, silage, sweet corn cannery waste, grain dust], swine and poultry [grain].

No detectable residues [<0.01 ppm] of MAT 7484 [or OMAT] were shown to occur in any corn commodity from the crop field trials [maximum rate, minimum preharvest interval] or the processing study [5X the proposed use rate].

Accordingly, conventional feeding studies [ruminant, poultry] were not conducted. In this instance, the metabolism studies submitted [goat, hen] may also serve as feeding studies.

The goat metabolism study was conducted at a rate equivalent to 10.4 ppm in feed. This value is 2190% the daily dietary burden that would be expected when feeding corn commodities treated with MAT 7484 at the maximum proposed field use rate [0.15 lb ai/A]. [See Attachment 2 for calculation.]

Residue levels of MAT 7484 [and OMAT] in tissues and milk from goats treated with [pyrimidyl-2-14C] MAT 7484 were reported as:

	Ppm 14C	Perc	ent	Ppr	n-1	Ppm	ı –2
<u>Matrix</u>	Residue	MAT	OMAT	MAT	OMAT	MAT	OMAT
Kidney	0.160	0	0	0	o	0	0
Liver	0.050	23	1	0.012	0.0005	0.000005	0.0000002
Fat	0.007	62	2	0.004	0.0001	0.000002	<0.000001
Muscle	0.003	38	<1	0.001	<0.0001	0.000001	<0.000001
Milk	0.008	69	4	0.006	0.0003	0.000003	0.0000001

Ppm-1 = Ppm residue at rate dosed in feed [10.4 ppm]
Example: Liver: 0.050 ppm x 23% = 0.012 ppm

Ppm-2 = Ppm residue at maximum label use rate [Ppm-1 ÷ 2190X] Example: Liver: 0.012 ppm ÷ 2190X = 0.000005 ppm

The poultry metabolism study was conducted at a rate equivalent to 21 ppm in feed. This value is 15,000% the daily dietary burden that would be expected when feeding corn kernels treated with MAT 7484 at the maximum proposed field use rate [0.15 lb ai/A]. [See Attachment 2 for calculation.]

Residue levels of MAT 7484, [and OMAT] in tissues and eggs from hens treated with [pyrimidyl-2-4C] MAT 7484 were reported as:

	Ppm ¹⁴ C	Perc	cent	Ppm	-1	Ppm-2	<u> </u>
<u>Matrix</u>	<u>Residue</u>	MAT	OMAT	MAT	OMAT	MAT	OMAT
Liver	0.778	<1	0	<0.008	0	<0.0000005	0
Kidney	0.519	1	0	0.005	0	0.0000003	0
Gizzard	0.131	61	0	0.080	0	0.000005	0
Skin	0.037	2	0	<0.001	0	<0.000001	0
Fat	0.024	61	0	0.015	0	0.000001	0
Heart	0.016	8	0	0.001	0	<0.000001	0
Muscle	0.011	2	0	<0.001	0	<0.000001	0
Eggs	0.005	0	0	0	0	0	0

Ppm-1 = Ppm residue at rate dosed in feed [21 ppm]
Example: Fat: 0.024 ppm x 61% = 0.015 ppm

Ppm-2 = Ppm residue at maximum label use rate [Ppm-1 ÷ 15,000X] Example: Fat: 0.015 ppm ÷ 15,000X = 0.000001 ppm

These metabolism studies demonstrate that residues of MAT 7484 [or OMAT] well below the limit of detection [0.01 ppm] are to be expected in meat, milk, poultry, and eggs from the feeding of corn commodities treated at the maximum proposed label use rate [0.15 lb ai MAT 7484 per acre].

Conclusions:

- (1) We concur that conventional feeding studies for MAT 7484 are not required to support the proposed use on corn.
- (2) The metabolism studies demonstrate there is no reasonable likelihood of secondary residues occurring in meat, milk, poultry, or eggs as a result of the proposed use on corn; category 3 of 40 CFR 180.6(a) applies.
- (3) There is no need for tolerances or analytical methods for meat, milk, poultry, or eggs in conjunction with the proposed use on corn.

CODEX HARMONIZATION

An international residue limits [IRL] status sheet is appended to this review as Attachment 3. There are no IRLs for MAT 7484 in/on any crop.

Conclusion: Harmonization with Codex is not an issue.

OTHER CONSIDERATIONS

A DRES run will need to be conducted by SAB/HED. It will be requested when all outstanding deficiencies have been resolved.

Conclusion:

A DRES run is needed. It will be requested when all deficiencies have been resolved.

ATTACHMENT (1): MAT 7484 Data Evaluation Record

(2): Calculations of the Dose Exaggeration Values in the Corn, Goat, and Poultry Metabolism Studies.

(3): International Residue Limits Status Sheet

(4): CONFIDENTIAL APPENDIX

cc (without Attachment 4): Circ, Dynamac

cc (with <u>all</u> Attachments): M. Nelson, RF, PP#1F4025, PP#2G4048, SF, CCB/HED (Kocialski).

H7509C:CBTS:MJN:mjn:CM#2:804:305-7324:4025MAT.RC1:3/26/93. RDI:SecHd:RSQuick:3/26/93:BrSrScientist:RALoranger:4/2/93.



Environmental Services

Final Report

MAT 7484 PP#1F4025/2G4048

TASK 4 Data Evaluation Record

December 21, 1992

Contract No. 68-D2-0053

Submitted to:
U.S. Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
2275 Research Boulevard
Rockville, MD 20850-3268



DATA EVALUATION RECORD

STUDY TYPE:

MRID NOS:

AUTHORS, REPORT TITLES, STUDY I.D. NOS, & DATES OF REPORTS:

Magnitude of the residue in or on field and sweet corn and in field corn processed commodities.

420054-88 through 420054-96

42005488. W.L. Leslie. Magnitude of the residue on U.S. field corn, band application. Laboratory ID Nos. 38976-1 and 38976-2. Mobay Project ID No. M419C002. Mobay Report No. 100341. 2/27/91.

42005489. W.L. Leslie. Magnitude of the residue on Canadian field corn, band application. Laboratory ID Nos. 39062-1 and 39062-2. Mobay Project ID No. M419C006. Mobay Report No. 101201. 4/2/91.

42005490. W.L. Leslie. Magnitude of the residue on U.S. field corn, in-furrow application. Laboratory ID Nos. 39128-1 and 39128-2. Mobay Project ID No. M419C004a. Mobay Report No. 100362. 2/27/91.

42005491. W.L. Leslie. Magnitude of the residue on Canadian field corn, in-furrow application. Laboratory ID Nos. 39130-1 and 39130-2. Mobay Project ID No. M419C007. Mobay Report No. 101208. 4/3/91.

42005492. W.L. Leslie. Magnitude of the residue on US sweet corn and sweet corn processed product, band application. Laboratory ID Nos. 38979-1 and 38979-2. Mobay Project ID No. M419C001. Mobay Report No. 100342. 2/28/91.

42005493. W.L. Leslie. Magnitude of the residue on Canadian sweet corn and sweet corn processed product, band application. Laboratory ID Nos. 39063-1 and 39063-2. Mobay Project ID No. M419C009. Mobay Report No. 101207. 4/4/91.

42005494. W.L. Leslie. Magnitude of the residue on US sweet corn and sweet corn processed product, in-furrow application. Laboratory ID Nos. 39129-1 and 39129-2. Mobay Project ID No. M419C004b. Mobay Report No. 100363. 2/28/91.

AUTHORS, REPORT TITLES, STUDY I.D. NOS., & DATES OF REPORTS [Continued]:

42005495. W.L. Leslie. Magnitude of the residue on Canadian sweet corn and sweet corn processed product, in-furrow application. Laboratory Project ID Nos. 39131-1 and 39131-2. Mobay Project ID No. M419C008. Mobay Report No. 101202. 4/4/91.

42005496. W.L. Leslie. Magnitude of the residue on field corn processed products. Laboratory ID Nos. 38980-1 and 39178-1. Mobay Project ID Nos. M419C003 & M419C005. Mobay Report No. 101206. 3/22/91.

PP#, REG. NO., ETC.:

PP#1F4025/2G4048

FORMULATION NAME:

AZTEC 2.1 G

Percent active ingredient: 2% MAT 7484 and 0.1% cyfluthrin

TEST MATERIALS APPLIED TO CROP: MAT 7484 [O-(2-(1,1-dimethylethyl)-5-pyrimidinyl)-O-ethyl-O-(1-methylethyl)phosphorothioate; CAS No. 96182-53-5]

and cyfluthrin [cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropanecarboxylate; CAS No. 68359-37-5]

RESIDUES MEASURED:

MAT 7484 and MAT 7484 oxygen analog [O-(2-(1,1-dimethylethyl)-5-pyrimidinyl)-O-ethyl-O-(1-methylethyl) phosphate

[Note: Residue data for cyfluthrin are presented in a separate

DER.]

TESTING LABORATORIES:

Analytical Bio-Chemistry Laboratories, Inc, Columbia, MO.

(Samples from field residue trials)

STUDY SPONSOR:

Mobay Corporation, Agricultural Chemicals Division, Kansas

City, MO.

SUMMARY OF DATA

Field corn: Mobay submitted data (1991; MRIDs 42005488-42005491) from field residue trials conducted between 1989 and 1990 depicting residues of MAT 7484 and MAT 7484 oxygen analog in or on field corn grain and fodder. In 16 trials conducted in IL(2), IN(2), IA(1), KS(2), MN(1), NE(2), TX(2), and Ontario, Canada (ON;4), field corn was treated with a single soil band or in-furrow application at planting of the 2% G formulation (AZTEC 2.1 G) at 0.0125 g ai/m of row, which is equivalent to 0.0084 lb ai/1,000 feet of row or 0.159 lb ai/A (with a 30 inch row spacing); tests conducted in MN and TX utilized slightly higher rates (0.014 g ai/meter of row). [Note: The recommended label use rate on corn is 0.0088 lb ai/1,000 feet of row.] Field corn grain and fodder samples were harvested 101-174 days posttreatment.

Residues of MAT 7484 and its oxygen analog are presented in Table 1. The residue values presented in this table are not corrected for method recovery. According to Table II of Subdivision O Guidelines, the raw agricultural commodities of field corn are grain, forage, fodder, and silage; CBTS does not require data or a tolerance for silage since data for forage and fodder, when available, are considered sufficient.

Table 1. Residues of MAT 7484 and MAT 7484 oxygen analog in or on field corn grain and fodder samples harvested 101-174 days following a single soil band or in-furrow application of the 2% G formulation (AZTEC 2.1G) at 0.0084 lb ai/1,000 feet of row.

	Application		Number of	PTI	Resid	dues (ppm)
Matrix	Method	Test Locations	Samples	(Days)	MAT 7484	Oxygen analog
Grain	Soil band	IL, IN, IA, KS, MN, NE, TX, ON	10	101-174	<0.01	<0.01
Grain	In-furrow	IN, IL, KS, NE, TX, ON	6	120-162	<0.01	<0.01
Grain	Untreated	IL, IN, IA, KS, MN, NE, TX, ON	16		<0.01	<0.01
Fodder	Soil band	IL, IN, IA, KS, MN, NE, TX, ON	10	101-174	<0.01	<0.01
Fodder	In-furrow	IL, IN, KS, NE, TX, ON	6	120-162	<0.01	<0.01
Fodder	Untreated	IL, IN, IA, KS, MN, NE, TX, ON	16		<0.01	<0.01

Geographic representation for the field corn trials is adequate since the test states of IL(17%), IN(9%), IA(20%), KS(2%), MN(10%), NE(12%), and TX(2%) accounted for ca. 70% of the 1990 U.S. field corn production (USDA Agricultural Statistics, 1991).

Mobay also submitted data (1991; MRID 42005496) from a processing study conducted between 1989 and 1990 depicting residues of MAT 7484 and its oxygen analog in the processed commodities of field corn. Field corn grain samples were harvested 121 and 169 days following the last of a single soil band application of the 2% G formulation (Aztec 2.1G) at 0.0624 g ai/m of row, which is equivalent to 0.042 lb ai/1,000 feet of row or 0.8 lb ai/A (5x the maximum recommended label rate). Field corn grain samples were wet- and dry-processed by the Food Protein Research and Development Center at Texas A&M University (College Station, TX) according to simulated commercial practices.

Residues of MAT 7484 and its oxygen analog were nondetectable (<0.01 ppm each) in or on two samples of field corn grain; in one sample each of flour, grits (small, medium, and large), meal (including coarse meal), and starch; in one sample each of crude and refined oil from dry processing; and in one sample each of crude and refined oil from wet processing. Apparent residues of MAT 7484 and its oxygen analog were nondetectable (<0.01 ppm each) in or on two samples of untreated field corn grain and in the following commodities processed from untreated grain: one sample each of flour, grits (small, medium, and large), meal (including coarse meal), and starch; in one sample each of crude and refined oil from dry processing; and in one sample each of crude and refined oil from wet processing. The petitioner stated that analyses for grain dust were not conducted because soil applications of cyfluthrin are not expected to result in measurable surface residues on the grain.

Sweet corn: Mobay submitted data (1991; MRIDs 42005492-4205495) from field residue trials conducted in 1989 and 1990 depicting residues of MAT 7484 and MAT 7484 oxygen analog in or on sweet kernels, cobs, and forage. In 16 trials conducted in CA(1), FL(2), IL(1), MN(2), NY(2), OR(1), WA(1), WI(2), and ON(4), field corn was treated with a single soil band or in-furrow application at planting of the 2% G formulation (AZTEC 2.1G) at 0.0125 g ai/m of row, which is equivalent to 0.0084 lb ai/1,000 feet of row or 0.159 lb ai/A (with a 30 inch row spacing). [Note: The recommended label use rate on corn is 0.0088 lb ai/1,000 feet of row.] Sweet corn forage, kernel, and cob samples were harvested 58-103 days posttreatment.

Residues of MAT 7484 and its oxygen analog are presented in Table 2. The residue values presented in this table are not corrected for method recovery. According to Table II of Subdivision O Guidelines, the raw agricultural commodities of sweet corn are sweet corn (kernels plus cob with husk removed) and forage. The registrant stated that residues in sweet corn cannery waste were not determined because no detectable residues of MAT 7484 or its oxygen analog were found in any sweet corn cob or forage sample. CBTS does not require data for the cannery waste of sweet corn if forage data are available.

Table 2. Residues of MAT 7484 and its oxygen analog in or on sweet corn kernels, cobs, and forage samples harvested 58-103 days following a single soil band or in-furrow application of the 2% G formulation (AZTEC 2.1G) at 0.0084 lb ai/1,000 feet of row.

	Matrix	Application Method	Test Locations	Number of Samples	PTI (Days)	Residues (ppm)
	Kernels	Soil band	FL, IL, MN, NY, OR, WA, WI, ON	10	61-103	<0.01
	Kernels	In-furrow	CA, FL, MN, NY, WI, ON	6	58-99	<0.01
	Kernels	Untreated	CA, FL, IL, MN, NY, OR, WA, WI, ON	16		<0.01
•	Cobs	Soil band	FL, IL, MN, NY, OR, WA, WI, ON	10	61-103	<0.01
	Cobs	In-furrow	CA, FL, MN, NY, WI, ON	6	58-99	< 0.01
	Cobs	Untreated	CA, FL, IL, MN, NY, OR, WA, WI, ON	16	*	<0.01
	Forage	Soil band	FL, IL, MN, NY, OR, WA, WI, ON	10	61-103	<0.01
	Forage	In-furrow	CA, FL, MN, NY WI, ON	6	58-99	<0.01
	Forage	Untreated	CA, FL, IL, MN, NY, OR, WA, WI, ON	16		<0.01

Geographic representation for the sweet corn field trials is adequate since the test states of CA(2%), FL(8%), IL(5%), MN(19%), NY(7%), OR(10%), WA(12%), and WI(20%) accounted for ca. 80% of the 1990 U.S. sweet corn production (USDA Agricultural Statistics, 1991).

Residue Analytical Methods

Residues of MAT 7484 and MAT 7484 oxygen analog in all field and sweet corn commodities were determined by Analytical Bio-Chemistry Laboratories using gas chromatography with flame photometric detection (GC/FPD) according to the method in Mobay Report No. 100202 (MRID 420054-83). Briefly, samples are extracted with acetone:water (9:1, v:v), filtered, and partitioned with methylene chloride. Methylene chloride fractions are purified by gel permeation chromatography (GPC). The GPC eluates are evaporated, resuspended in acetone, and quantified by GC/FPD (phosphorous filter) on a DB-1 megabore column. The limits of detection are 0.01 ppm each for MAT 7484 and its oxygen analog in the field and sweet corn matrices analyzed. Representative chromatograms and sample calculations were included. Method recoveries of MAT 7484 and MAT 7484 oxygen analog from field and sweet corn commodities are presented in Table 3.

3)

Table 3. Method recoveries of MAT 7484 and MAT 7484 oxygen analog from field and sweet corn commodities.

	Number of	MAT	7484	Oxyger	analog
Commodity	Samples	Fort. (ppm)	Recovery (%)	Fort. (ppm)	Recovery (%)
Field corn					
Grain	10	0.01-0.1	85-120	0.01-0.1	70-105
Fodder	9	0.01-0.1	70-110	0.01-0.1	75-110
Grain (processing study)	2	0.01, 0.1	96, 97	0.01, 01	92, 94
Grits	4	0.01-0.05	80-100	0.01-0.05	70-98
Flour	4	0.01-0.05	70-90	0.01-0.05	70-90
Meal	2.	0.1	83, 88	0.1	83, 87
Starch	5	0.01-0.05	110-120	0.01-0.05	110-120
Crude oil	4	0.01	80-90	0.01	100-110
Refined Oil	2	0.01	80, 90	0.01	100, 120
Sweet corn					
Kernels	9	0.01-0.1	76-100	0.01-0.1	75-110
Cobs	8	0.01-0.1	88-108	0.01-0.1	100-108
Forage	9	0.01-0.1.	82-113	0.01-0.1	70-115

Storage Stability Data

All field corn and sweet corn commodity samples were stored frozen at ca. -20° C prior to analysis. The storage intervals for each commodity are presented in Table 4.

Storage stability data (Mobay Report No. 99776, MRID 420054-77; and, Mobay Report No. 101234, MRID 420054-87) pertaining to field corn grain, sweet corn kernels, corn forage and fodder were submitted to support the field trial and processing studies. Those data indicate that residues of MAT 7484 and its oxygen analog are stable (96-100%, MAT 7484; 85-96%, MAT 7484 oxygen analog) for up to 515 days when stored frozen at -20° C.

Table 4. Sample storage intervals between harvest and analysis of field and sweet corn commodities stored at ca. -20 C.

Commodity	Storage Interval (Days)*
Field corn	
Grain	62-369
Fodder	81-368
Grain (processing study)	83, 449
Grits	427, 428
Flour	411
Meal	410
Starch	83
Crude oil	143, 504
Refined oil	143, 504
Sweet corn	
Kernel	76-493
Cobs	92-457
Forage	91-445

^{*} Calculated by the study reviewer.

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Formulation

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	₹ :	,			Kernels	•	•	CONTROL	•	6.0	60.01		 -	× 1	<u>3</u> K	•	
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	Ē	-,			Kernels	•	•	CONTROL	•	6.01	-0.03	0.1	0.1	ð	ď		3.
	5 8	? •			Kernels	•	•	CONTROL	•	<0.01	*0.0	0.1		8 8	8 8		
	5 8	- ,			Kernels	•	•	CONTROL	•	<0.01	60.0			. .	:	• •	
	5 :	•			Kernels		•	CONTROL	•	<0.01	<0.01	•		3.	3.		
42005492 89	§ :	- ,		,	Kernels		ţ.,	CONTROL		6 .03	60.03			*		, ;	
	;				Kernels	•	. 1	CONTROL	.•	<0.01	<0.01					•	ָרָם. מינייייייייייייייייייייייייייייייייייי
	i	-	S 199MA	200	Kernels	•	•	CONTROL		6.0	<0.01					•	
42005494 90	5	-	Supply	2	Kennela	1		, , , , , , , , , , , , , , , , , , ,	1				•			•	
	.	-			Kennele		- 4	0.139	21	6.0 6.0	6 .04				•	110	Ca2
	!	• -			Kernele	To-function		90.10	2 8	60.03	6.01					23	ca20
	¥	· ÷			Kernel e	To-6:100		0.13W	2 8	6.9 9.9	60.01		,		•		ca20
	5				Kennele		- ,	0.13V	6	-0.0y	6.01						
	3 5	- ,-			819619	In-Turion	- ,	951.0	8	6.03	6.01 10.03						
	3	•			ACTINELS	In-Turion	 ~	0.159	æ	*0.01	60.01					26	
42005492 89	Z,	-	Sweet CC	corn	Kernels	Soil band		150	*	10 0						•	
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	₹								<u>ر</u> و	5.5	6.5 6.5					441	ca20
42005492 89	¥	-							2 :	0.00	2.5						ca20
	8	M									6.01 6.01						ca2(
	8) - -									ć0.03				Ħ.	83	ca20
	:						4	0.159	5 G		6.01				•		ca20
	i	-					-				**************************************						
	ĵ	_	Supply of	7	Variation	Coff Land				5	5.0					419 c	ca20

TREED YR	2	NO OF	ES CONT	O V	APPL	2		II.	RESIDUES (ppm)	(mdd) s		Fortifcation	*	X PEroves		
2005488 80	1	-				744	V/10 (1)	(days)	MAT7484	MAT7484 Oxy Analog	MAT7	4 Oxy Analog	1	MAT7484 Oxy Analog	Storage g Interval	Temp.
	₹	- ,-	Field corn	rodder		•	CONTROL		<0.01	<0.0	0.1(2)	0.1(2)	8	80 or or		
42005488 89	₹	_	Field corn	Footber	Soil hand		CONTROL	• {	6.0 9.0	<0.01	0.1		} =	č	•	
	₹	-		Grain	Soil Dead	- •	0.159	152	6.0 0.0	.0.01			.		. 22	
(2002488 89	坚	-	Field corn	Forther		-	0.159	152	60.01	60.0 2					200	
42005488 89	#	-		Grein	•		CONTROL	•	60.0	<0.01					‡	
42005488 89	¥	,-		Southern	1000		CONTROL	•	6 2.0	<0.01				•	•	
42005488 89	및			Grafa	Soil Dang	, , ,	0.159	3	6 .03	<0.01	. *					
42005488 89	\	-		Fortier		;	0.159	2 48	60.0 3	<0.01					ž	
42005488 89	\(\)	—		Grain	• 1	•	CONTROL	•	60.0	<0.01					Š	
42005488 89	\	-		Foodor	Soil hand		CONTROL	. !	6. 9.	. 0.01					•	
42005488 89	S	-		Grain	Soil bend	- ,-	0.159	147	6.0	0.0					200	2
42005488 89	=	-		Fodber		- 1	0.138	<u>}</u>	6.0 0.0	60.01					i i	_ '
42002488 89	=	_		Grain) = . 1		CONTROL	•	6 .03	<0.01					?	
42005488 89	=		Field corn	Fodber	Soil hered			. :	60.03 10.03	6 .01					•	
2005488 89	=	_		Grain	Soil Part		0.138	9 (ê. 9						117	
42005488 89	=	-	Field corn	Fodder		<u>.</u>	Course Course	3	ê. 2. 6	60.0 3			. •		¥ \$	
42002488 89	=	-	Field corn	Grain	•	٠,	CONTROL	•	.e.	6.0					} '	
(50054 88 8 9	Ξ	_	Field corn	Fodder	Soil head			. [5	.0.0 .0.0					•	
42005488 89	=	_	Field corn	Grain	Soil hand	- ,-	450	70.	S 6	6.0 .0					2	
42005488 89	X	-	Field corn	Fodder		٠,	CONTROL	70	5 6	5 6					338	-
*2002488 B9	≱;	(**	Field corn	Grain			CONTROL		5 6	5.5					•	
	×	-	Field corn	Fodder	Soil band	-	0.150	5	5 6	5.6					•	
00 00+cnn24	<u>×</u> ;	- ,		Grain	Soil bend	_	0.159	<u> </u>	6 6 6	5 5					283	
42002400 09 42005488 80	2 5	- ,		Fodder		•	CONTROL		0.0	5.0			•		262	ca20
	2 5	-,-		Grein	•	•	CONTROL	•	6.0	40.0	7				•	ca20
62005488 80	2 2		_	Fodder	Soil bend	_	0.159	174	6.0	<0.01					• {	
	· ·	- 4	Field corn	Grein	Soil bend	_	0.159	174	60.0	0.0					8	-
		.		Logge		•	•	•	•		.01-0.056	0.01-0.05(4) 0.01-0.05(4)	1 70-110	000	Ş.	S
		, 2				•			• *	•	0.05	0.05				•
		٠,		·												
42005489 89 42005489 89	3 5	M) N	Field corn	Fodder	•	•	CONTROL	•	<0.01	<0.01	Ğ	•	à	•		
	5 8	۱,		erain Fried	•				6.01	<0.01	0.1		t y	2 8		
	8	, M	Field com		Sol David	₽,	٠.	_	60.01	<0.01	,	•	}	•		
	5 8) <i>L</i>			Soll Dand	-	0.159 14	141-147	<0.01	60.03					o	? •
	F	•					•		•		01-0.05(5	0.01-0.05(5) 0.01-0.05(5)) 90-120	70-104	ò	
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42005490 90	¥ ;	, - - ,		Fodder		3	CONTROL		c0.01	60 03	- -	•	,			
45005450 90 45005450 90	¥ ;	ر و سر		Grain	•	٠	CONTROL	•	0.01	0.0		- • - •	3 §	ĸ		
		, ce		Fodder	In-furrow		•	•	0.01	0.01	; ;	-	≧	202		
2 8	# 1	,		Grain	In-furrow			7	<0.01 0.01	. O. O.		: * ;				
2 8	¥ ;			Fodder		Ü		·	40.01	. O.						
2 8	× ?	, -		Grain	•	<u>ن</u>				0.0	31.					
2 8	¥.	_	Field corn	Foolder	In-filmon	•										S
	`	•				_	0.159	1 <u>20</u>							,	

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Formulation

1	į.		10 OF	n sa		APPL	2		PT	RESIDUES (pom)	(mod)	Forti	Fortifcation	X RECOVERY		Storage	
11 Field corn Credit Fried corn Cr	HRID YR	S 201	AMPLES	i	RAC	METHOD	APPL.	lb ai/A	(days) MAT7484	Oxy Analog	MAT7484	Oxy Analog	MAT7484 OKY AF		erval	
	42005490 90	=	-	Field corn	Fodder	•	•	CONTROL	•	60.01	60.01						
		=	- 	Field corn	Grain	•	•	CONTROL	20°	60.0 3	60.0					-	
		=	-		Fodder	In-furrow	-	0.159	153	6.0	<0.01						
10 1 Field com Fodds		=	·	Field corn	Grain	In-furrom	_	0.159	153	.0.01	0.03						
		=	_	Field corn	Fodder	•		CONTROL	•	0	c0.01						
		=			Grain	.•	•	CONTROL	• [6.0				•		
90 11 Field corn Fresh 11 Field corn Fresh 11 Field corn Fresh 12 Fresh 12		=	,	Field corn	Fodder	In-turior	-	0.159	152	6. 9	5. 5.						
		=	4	Field corn	Grain	In-furror	_	0.159	152	.0.01					•		
		2	_		Fodder	•	•	CONTROL	•	60.0	6.0	,					
		X S	<u>_</u>		Grain	•	•	CONTROL	,•	.0.01	60.01						2
Field corn Freid corn Fre		¥2	_		Fodder	In-furrom	,	0.159	153	6.01	0.01				r.		R
Field corn Fodder Couling Gall Gal		2	-		Grein	In-furron	-	0.159	153	6.0	6.0°					f.,	2
				÷ .													
		3		Rield con	Souther		•	CONTRO	•	00	<0.01	1.0	0.1				
Field com		5 8					•	CONTROL	•	9	0.0					, ₀	
		5 8			Fodder	In-furrow	-	0.159	148	6 0.03	60.0 3	3	•				2
Second Corn		8	-	Field corn	Grain	In-furrow	-	0.159	3	6.0	<0.01						
99 MR 1 Sweet corn Kornage CONTROL -0.01 0.01<			•										:				
99 MIL I Sweet corn Columbia Columbia </td <td></td> <td>₹</td> <td>_</td> <td></td> <td>Forage</td> <td>•</td> <td>•</td> <td>CONTROL</td> <td>•</td> <td>.0°</td> <td>6.0</td> <td>0.1</td> <td> </td> <td></td> <td>٥.</td> <td></td> <td></td>		₹	_		Forage	•	•	CONTROL	•	.0°	6.0	0.1	 		٥.		
99 NM 1 Seest corn Cobs - Coll band 0.159 96 4.01 4.01 0.11 104 106 106 106 106 106 106 106 106 106 107<		₹	-		Kernels	•	•	CONTROL	.6	60.01	6.03 0.03		C.0		٠.		
99 NM 1 Sewest corn Foregae 5011 band 1 159 96 4.01		₹			Cope	•	•	CONTROL	•	.0°	0.0	0.1	0.1				
99 MR 1 Sweet corn Kernels Soil band 1 0.159 98 d.01 40.01		₹	· 		Forage	Soil bend		0.159	8	6. 9.	60.01	, ,					
99 OR 1 Sweet corn Cobes Soil band 1 0.159 76 d.01 40.01 </td <td></td> <td>₹</td> <td>,</td> <td></td> <td>Kernels</td> <td>Soil bend</td> <td></td> <td>0.159</td> <td>8</td> <td>6.9</td> <td>6.0</td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td>		₹	,		Kernels	Soil bend		0.159	8	6 .9	6.0					_	
Seest corn Forese CONTROL		Ī	-		2 00	Soil Dend	-	0.159	2	60.03 0.03	\$ 6.5 5.6			,			
99 OR Sweet corn Kernels COMINOL - 0.19 - 0.01 -		క	, ,		Forage	•	•	CONTRO	•	5 S	50.0						
90 OR Sweet corn Cools Cools Cool		5	,		Kernels	•	•		•	; ;	5.5						2 5
99 UK Sweet corn Forage 0.159 103 4.01		5	-,		800		•		100	5 6	5.6				•	•	2
99 LW Sweet corn CONTROL <		5	-,		Porage	Due Tios		150	3 5	5 5	5 6					٠,	
By LM Sweet corn Foreget CONTROL - G.01 -	40 74 C	5 8			Wei The La	100		150	3 5	500	5 0						
## 1 Sweet corn Cobs		5 3						CONTROL	} .	6.6	0.0						
By LM Sweet corn COMTROL - 6.01 4.01		E 3			Yernels	٠	•	CONTROL	,0	40.0 3	6.01				•		
By LM Sweet corn Forage Soil band 1 0.159 100 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01		6 3			a do	•	•	CONTROL	•	6.0	<0.01	į,					
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B9 IM Sweet corn Cobe Soil band 1 0.159 100 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0.01 <0		1 3	-		Kernels	Soil band	-	0.159	8	<0.01	.0.0				•		2
B9 NY 1 Sweet corn Forage CONTROL <0.01 <0.01 B9 NY 1 Sweet corn Kernels CONTROL <0.01 <0.01 B9 NY 1 Sweet corn Cobs CONTROL <0.01 <0.01 B9 NY 1 Sweet corn Cobs Soil band 1 0.159 81 <0.01 <0.01 B9 NY 1 Sweet corn Cobs Soil band 1 0.159 81 <0.01 <0.01 B9 NI 1 Sweet corn Cobs Soil band 1 0.159 81 <0.01 <0.01 B9 NI 1 Sweet corn Kernels CONTROL <0.01 <0.01 <0.01 B9 NI 1 Sweet corn Cobs <0.01 <0.01 <0.01 <0.01 B9 NI 1 Sweet corn Cobs <0.01 <0.01 <0.01 <0.01 B9 NI 1 Sweet corn Forage Soil band <0.01 <0.01 <0.01 B9 NI 1 Sweet corn Forage <0.01 <0.01 <0.01 B9 NI		E			Cobs	Soil band		0.159	8	6 .01	. 0.0			•		Ξ.	ଥ
B9 NY 1 Sweet corn Kernels - CONTROL - CO.01		i à	-		Forage	•	•	CONTROL	•	<0.01	60.03					-	2
89 NY 1 Sweet corn Cobs - CONTROL - <0.01 <0.01 80.01		\	. 400		Kernels	•	•	CONTROL		6.0	<0.01						R
89 NY 1 Sweet corn Forage Soil band 1 0.159 81 <0.01 <0.01 80.01 80.01 80.01 80.01 60.01 60.01 8		À	-		Sobs	•	•	CONTROL	•	*0.0	6.01						2-
89 NY 1 Sweet corn Kernels Soil band 1 0.159 81 <0.01 <0.01 80.01		È	_		Forage	Soil bend	<u>_</u>	0.159	2	*0.0	. 0.01					-	? ?
89 NY 1 Sweet corn Cobs Soil band 1 0.159 81 <0.01 <0.01 89 NI 1 Sweet corn Forage - CONTROL - <0.01 <0.01 89 NI 1 Sweet corn Kernels - CONTROL - <0.01 <0.01 89 NI 1 Sweet corn Cobs - CONTROL - <0.01 <0.01 89 NI 1 Sweet corn Cobs - CONTROL - <0.01 <0.01 89 NI 1 Sweet corn Forage Soil band 1 0.159 68 <0.01 <0.01 89 NI 1 Sweet corn Kernels Soil band 1 0.159 68 <0.01 <0.01		¥	-		Kernels	Soil band	-	0.159	2	<0.01	6.01				.		2
89 WI 1 Sweet corn Forage CONTROL - <0.01 <0.01 89 WI 1 Sweet corn Kernels CONTROL - <0.01 <0.01 89 WI 1 Sweet corn Cobs CONTROL - <0.01 <0.01 89 WI 1 Sweet corn Forage Soil band 1 0.159 68 <0.01 <0.01 89 WI 1 Sweet corn Kernels Soil band 1 0.159 68 <0.01 <0.01		≩	-		Cobs	Soil band	-	0.159	20	<0.01	60.0 3						2.
89 WI 1 Sweet corn Kernels CONTROL - <0.01 <0.01 89 WI 1 Sweet corn Cobs CONTROL - <0.01 <0.01 89 WI 1 Sweet corn Forage Soil band 1 0.159 68 <0.01 <0.01 89 WI 1 Sweet corn Kernels Soil band 1 0.159 68 <0.01 <0.01		3	-		Forane	•	•	CONTROL	•	-0.01	<0.01			3		٠.	-20
89 WI 1 Sweet corn Cobs - CONTROL - <0.01 <0.01 <0.01 5.00 577 ca. 69 WI 1 Sweet corn Forage Soil band 1 0.159 68 <0.01 <0.01 5.00		5	_		Kernels	•	•	CONTROL	ì	<0.01	<0.01						
89 WI 1 Sweet corn Forage Soil band 1 0.159 68 <0.01 <0.01		5	هي ،		Cops	,	•	CONTROL	•	6 .01	- 40.01					· .	
89 VI 1 Sweet corn Kernels Soil band 1 0.159 68 <0.01 <0.01		5	, î		Forage	Soil band	_	0.159	8	*0.03	<0.01				M)		
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1 Section Compact		=	-		Forage	ì	•	CONTROL	•	c 0.01	60.01		*		1 j			2
1 Secret corn Colors C		=	, .		Kernels	•	•	CONTROL	•	6.0°	6.0 2.0		•	•		•		ខុះ
1 Seest con Grange Soil band 0.159 72 40.0	_	=	_		e Cope	•	•	CONTROL	• {		6.9 6.9					. }		3
1 1 1 1 1 1 1 1 1 1	-	≓ :	- (Forage	Soil bend	- 4	0.159	2 5	8 2 2 2	ê 6 5 6					585 7		2 8
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	_	- 0						CONTROL	į ,	5 5	9					, ,		Ŗ
		1 =			Kernela			CONTROL	•	6.0	6.0					•		នុ
	. 41	đ a				. •		CONTROL	,	0.0	9				•			Ŗ
Fig. Example Corn Colore		:			Fores			0.150	19	6.0	9		•	٠.		445		R
## 1 Sweet corn Cote Cote		: =	- ģ		Kernela			0,159	3	0.0	60.0		-			667		នុ
		: -	- 440		Cope	Post 1		0.159	2	0.0	ê 5					457		S
Second Corner Cor		<u>.</u>			Forage		•		•	•	•	0.05	0.05		13	•	•	
90 Courting C			4		Kernels	•	•	•			•	0.01-0.05(4)	0.01-0.05(4)		90-110	•	•	
90 Oil 3 Seset corn Forege COMITOL 40.01 40.01 0.11 114 106 cc. 90 Oil 3 Seset corn Corne Control COMITOL 40.01 40.01 0.11 111 107 106 cc. 90 Oil 3 Seset corn Forege Soli band 1 0.159 81 40.01 40.01 0.11 111 107 338-420 cc. 90 Oil 3 Seset corn Forege Col 10 40.01 40.01 0.11 111 107 358-420 cc. 90 Oil 5 Seset corn Forege Col 10 40.01 40.01 0.11 0.11 107 104 106 358-420 cc. 90 Oil 5 Seset corn Forege Col 10 40.01 40.01 0.01 0.01 10.01		•	*		Co Co Co	-,-	•	•	•	•	•	0.01-0.05(4)	0.01-0.05(4)		100-108	•	•	
99 ON 3 Sewest corn Courred. CONTROL G.01 G.01 G.11 G.11 104 106 c. 99 ON 3 Sewest corn Control CONTROL G.01 G.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td>· · ·</td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						· · ·					•							
Second Corn.	1.5	3	M		- Spenda	•	•	CONTROL	•	60.0	60.03	-	0.1	2	5			-20
Second corn Going Second corn Going		5 8) M		Kernela		•	CONTROL		6.0	0.0	0.1	0.1	8	8	•		2
Second Corn General Soil band 0.159 81 40.01 40.01		,	1 41		900	•		CONTROL	•	60.0 3	6 .0	0.1		111	107	•		នុ
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Formulation

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06 76750027	F	_	Sweet corn	Forage	•	•	CONTROL		<0.01	c 0.01					•	83	-20 C
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	! ជ		Sweet corn	Kernels	In-furrow	-	0.159	28	<0.01	<0.0 ³							ည ည
	: æ	t desp és		5	In-furrow		0.159	82	6.0	6.01					124	5	ଞ୍ଚ
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				4					5		6		8	6	•	5	-20 C
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45005496 89	KS	_	Field corn	Small grits			CONTROL	•	6.03	6.03			*. / _		• 1		
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42005496 89	KS	_	Field corn	Large grits			CONTROL	•	60.03	6.03			•		•		ָ ק
42005496 89	KS	_	Field corn	Meal		٠	CONTROL	•	60.03 10.03	6.9 10.9	0.1(2)	(ع)١.٥	8	8,0			
42002496 89	X	-	Field corn	Coarse mes!	•	•	CONTROL	•		5.5							
45005496 89	S	_	Field corn	Flour	•	i,	CONTROL	•	6.6	5.6	•	•	413	115			
2002496 90	S	_	Field corn	Starch	•	•	CONTROL	٠	5.6	5 6	- 3	200	00-0	100-110	•		8
45002496 89	KS.	,		Crude oil	•	•	CONTROL	1 ,, .	5.6	5 6	0.0.0	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	3	2	•		2
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	2	_		Refined of		. •			2	5 6					677		
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42005496 90	X.	_	Field corn	Refined oil	Soil bend	_	0	121	6.0 -		(//30 0 00 0	0.04-0.05(//)	80-100	70-08			
42005496 89	KS W	4	Field corn	Grits	•	•	•.	•	•	•	0.01-0.05(4)	0.01-0.05(4) 0.01-0-10.0 (7) 0.05 0.05(7) 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.0		20-02	•	•	
42005496 89	KS	7	Stelly corn	213	•		•	•	•	•							-
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RIN 0806-96 PP 1 F40 25

Pages 42 through 44 are not included.		
	<u> </u>	
The material not included contains the following type of information:	· · · · · · · · · · · · · · · · · · ·	
Identity of product inert ingredients.		
Identity of product impurities.		
Description of the product manufacturing process.		
Description of quality control procedures.		
Identity of the source of product ingredients.		
Sales or other commercial/financial information.		
A draft product label.		
The product confidential statement of formula.		
Information about a pending registration action.		
FIFRA registration data.		
The document is a duplicate of page(s)	. 8 . 440	
The document is not responsive to the request.		

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Phostebupirin	3/	15/73
CODEX NO.		
CODEX STATUS:	PROPOSED U.S. TOLERANCE:	
No Codex Proposal Step 6 or above	Petition No. 1F 4025 and RCB Reviewer M Nelson	
Residue(if Step 8):	Residue: phostebupirim *	
	_ LNEW O-P Pesticide	
Crop(s) Limit (mg/kg)	Crop(s)	Limit (mg/kg)
	Corn, fish (includes sweet)	0,01
	Corn grain, field and pop	0.01
	Corn, forage and fodder, field, pop, and sweet	0.01
CANADIAN LIMITS:	MEXICAN LIMITS:	
/V/ No Canadian limit	17 No Mexican limit	
Residue:	Residue:	
Limit Crop(s) (mg/kg)	Crop(s)	Limit (mg/kg)

NOTES:

Page 1 of 1 Form revised 1986

^{*} aka MAT 7484; BAY MAT 7484; Q-[2-(1,1-dimethylethyl)-5-pyrimidinyl] Qethyl Q-(1-methylethyl) phosphorothicate

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Pages through are not included.			
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The material not included contains the following type of information:	•	ř .	
Identity of product inert ingredients.			
Identity of product impurities.			
Description of the product manufacturing process.			
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Identity of the source of product ingredients.			
Sales or other commercial/financial information.			
A draft product label.			
The product confidential statement of formula.			
Information about a pending registration action.			
FIFRA registration data.			
The document is a duplicate of page(s)	 **	,	
The document is not responsive to the request.			